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ABSTRACT

In this study, the communicative interactions between African mothers and their infants at 4 to 5 months and 9 to 10 months are described. Particular attention is given to gaze, smiling, and vocalization. Results offer confirmation from another culture of the development of previously described forms of communication during the first year of life. The intense mutual regard and the interest and delight in one another characteristic of the younger group of infants substantiates the period of primary intersubjectivity as described by Trevarthen (1979). Similarly, the broadened perspective of the communication between the older infants and their mothers, encompassing topics other than themselves even in the absence of available near objects, conforms to that stage in communicative development described as secondary intersubjectivity. The mothers' behavior also corresponded to that described as typical among Western mothers. The only differences between the dyads studied and the reports in the literature were the persistence of face-to-face interaction for a longer period than is expected among Western dyads and the absence of communally ritualized infant games such as "pat-a-cake." Observations further indicated that African mothers seldom introduce toys or objects to their infants and seldom engage in object-play with their infants. (RH)

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DEVELOPMENT OF COMMUNICATION BETWEEN AFRICAN MOTHERS AND THEIR INFANTS IN THE FIRST YEAR OF LIFE.

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DEVELOPMENT OF COMMUNICATION BETWEEN AFRICAN MOTHERS AND THEIR INFANTS IN THE FIRST YEAR OF LIFE

Introduction

The characteristics of the infant's first relationship with an adult caretaker are of concern to most psychologists interested in understanding the origins and early development of thought, language, and the emotional attachments intrinsic to human beings. The interaction between an adult (usually the mother) and a pre-linguistic infant is regarded as the prototype of later linguistic communication, and as being continuous with it. As such, this first relationship marks the beginning of the infant's membership of what Trevarthen (1980) calls 'cultural consciousness'.

Through the investigation of mother-infant interactions, researchers have attempted to describe how this relationship is established, maintained and changed during the first year of life. The methods and topics of communication that appear in this relationship have yielded information about the growing abilities of infants and the special sensitivities of mothers that together ennable a dynamic and increasingly sophisticated form of communicative understanding.

More than a decade of studies have yielded fairly consistent descriptions of the changes that this relationship undergo. There is reasonable consensus regarding the existence of at least three phases in the development of the communication between mother and infant during the first year of life. During the first 4 months of life, a period referred to as 'primary intersubjectivity' (Trevarthen 1979) or as the 'affective reciprocity phase' (Adamson & Bakeman 1982), the interaction between mother and infant is characterised by intense interpersonal attention and the expression of positive affect. Interaction between the two is maintained by gaze, smiling and vocalisation directed towards the other. From 5-6 months of age the infant's engagement with the mother declines in favour of an interest in events and objects outside of the dyadic interaction. Although their interpersonal interaction declines it remains pleasurable and is mediated by games. This period of relative interpersonal quiescence is regarded as foreshadowing a new level of communication which becomes fully manifest from 9 months onwards. Mothers and infants then begin to communicate about objects and events other than themselves. They start to be able to refer one another to such events and objects and to coordinate their interaction in respect of these. This period has been referred to as that of 'secondary intersubjectivity' (Hubley & Trevarthen 1979) or as 'nonverbal referencing' (Adamson & Bakeman 1982). From this point on the infant will develop the skills necessary to refer others linguistically to matters of mutual interest

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These observations have been made under conditions generally referred to as 'en face' interaction (Brazelton et al 1974, Stern et al 1977, Trevarthen 1977) or modifications of it (Tronick et al 1979). It has been argued that such 'face-to-face' interchanges make the communication process manifest and introduce a degree of standardisation without reducing the complexity of the interaction in real time (Kaye & Fogel 1980). The intensive analysis necessary to unravel such observational data has resulted in studies of relatively small samples of mother-infant pairs. Nonetheless, the consistency of the changes over the first year, despite individual differences in maternal style, have resulted in these changes being regarded as basic developmental processes. As a consequence investigations of the interactions between mothers and infants whose histories may be presumed to affect such basic developmental processes have begun; for example, studies of high-risk (Field 1982) and malnourished infants (Rosetti-Ferreira 1978).

These developments in the infant's progression towards interpersonal competence are presumed to be universal and fundamental (Trevarthen 1977, Kaye 1982). Nonetheless, they occur within a cultural circumstance and Snow et al. (1979) have argued that the interactions observed between mothers and infants may be characteristic of only some cultural groups and may depend upon a set of maternal beliefs concerning the conversational potential of infants and the particular cultural norms for emotional expression. Much is known about the considerable social and cultural differences which exist in child-rearing attitudes and behaviour (see, for example, Caudill & Weinstein 1969, Lusk & Lewis 1972, Tulkin & Kagan 1972, Brazelton 1977, Goldberg 1977). But, as Schaffer observes, "a more process-oriented, detailed analysis of the interactions within which culture-determined variations in such practices occur is only now beginning to emerge" (1984, p. 67).

Those studies, using comparable methodologies, which have been done amongst other cultural groups have resulted in mixed findings. Trevarthen and Mundy-Castle studied Yoruba mothers interacting with their infants and concluded that their forms of communication were the same as those observed amongst Anglo-American dyads (Mundy-Castle 1980, Trevarthen & Marwick 1982). Nonetheless, they did find differences between the Yoruba and Scottish samples - Yoruba mothers vocalised less and so did their infants; they were more playful under all conditions and remained so for longer, and their infants' interest in interpersonal engagement did not decline as rapidly as did that of Scottish infants. Callaghan (1977) also reported that Hopi and Navajo mothers vocalised considerably less than American mothers during interaction with their infants, and Brazelton (1977) recorded lower levels of maternal looking, smiling and vocalising during feeding amongst Mayan Indian mothers. Tronick, Ricks & Cohn (1982) and Dixon et al. (1984) both report considerable containment of attention and arousal of infants by African mothers. In the case of Tronick et al.'s study of Gusii dyads, the interaction was rendered analogous to that observed when

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Western mothers withdraw from interaction with their infants, a condition assumed to place abnormal constraints upon the interactive expectations of infants.

There is a tendency to interpret these observed differences in maternal behaviour as being consistent with child-rearing ideology and a particular cultural agenda of values for personal development (for example, Kaye 1982); and to argue, as does Schaffer, that they do not indicate that there are actual differences in the structure of interaction (1984). Kaye states, for example, that "the observations in the literature indicate that any culturally or racially varying dimensions are superimposed upon a matrix of universal features of infant behaviour that promote certain kinds of universal adult responses" (1982, p. 185). However, there are few detailed reports of infant behaviour which would enable an evaluation of the effects of the observed maternal differences on interactional developments during the first year. These social and cultural differences may assist us in arriving at an understanding of the processes of adult support necessary for the infant's interpersonal development. As Kagan (1977) has stated, one of the functions of cross-cultural research is to allow for the greater specification of a functional relation; in this case, the relation that exists between maternal support and the infant's communicative expressions.

In this study, the communicative interactions between African mothers and their infants at two points during the first year will be described. The periods around 4-5 months and 9-10 months of age were chosen for study as they have both been identified as points of change in the dyad's communicative exchanges (Sugarman-Bell 1978, Fafouti-Milenkovi & Uzgiris 1979, Trevarthen 1980, a.o). Gaze, smiling and vocalisation as elements of each partner's communicative expression will be described and also the games played between mothers and infants as an index of the level of their communication and the interests subsumed by it.

Method

The filmed records of eighteen dyads, nine between 17-21 weeks and nine between 38-42 weeks were selected from the records of a quasi-longitudinal study of 24 mother-infant pairs filmed under five of the conditions of interaction used by Trevarthen and his co-workers: Chat, Clap, Toy, Straight Face and Post Straight Face (Trevarthen & Marwick 1982). In this paper, the results from only the Chat condition will be described. Approximately three minutes of film were obtained of the interaction between each dyad.

The mothers and infants were recruited through a well-baby clinic and all the infants were healthy and developmentally normal as assessed by the Bayley Scales of Infant Development. The mothers represented normative lifestyles in the district in which they lived. Some were happily married, well cared for by supportive husbands and with physical amenities such as television sets,

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telephones etc. Others were alone, having been abandoned by a husband or never married, and were finding it exceedingly difficult to meet the regular financial demands of rent, nourishing food, clothing and so on. All the families' lifestyles reflected their transitional status between traditional-tribal values and those of an urban environment (Appendix 1 provides a series of illustrative photographs of home environments). The families comprised a mix of the African ethnic and language groups resident in South Africa. The average level of education of the mothers was 7 years of schooling, with a range between 3 and 12 years.

The film recordings were made in a community health centre adjacent to the well-baby clinic and with the assistance of a community health nurse who also acted as an interpreter. Mother and infant were filmed sitting opposite one another, the infant being supported in a baby-chair at the same level as the mother. Videotaping was done with two cameras, without any special lighting and the full-face and upper-torso images of mother and infant were fed into a split screen generator together with a superimposed time digital display. Sound was recorded from a single microphone suspended from the ceiling, approximately two feet above the heads of the mothers and babies. Analysis of the videotapes was done on an editing machine (Sony VO-5800PS), operating at a usual rate of 60 frames per second. Tape speed could be varied between 0.3 and 5 times normal speed and the machine provided complete image resolution even when the tape was stopped.

Two coding systems were developed. One encompassed molecular levels of behaviour and the other covered functional units of interaction, and each was used to categorise behaviour after viewing different time intervals of the ongoing interaction. The first, a 2-second coding scheme, covered 9 behavioural domains, including gaze, coorientation, facial expression, vocalisation, body orientation, hand movements, play, care-taking and self-absorbed activities. Each domain subsumed a list of codes, for example, gaze comprised direct gaze at other, gaze away, follow movement of other, gaze at own hands etc. The second, a 10-second coding scheme, covered arousal, mood, affect, content of mothers' vocalisations, imitation and dialogue-like exchanges.

In order to facilitate the use of such a large coding scheme, a hardware connection was made between the video recorder and an Apple II micro-computer to enable the required viewing interval to be specified and automatically set in motion from the computer's keyboard. The controlling programme allowed the descriptive codes to be selected from a menu-system after viewing either 2 or 10 seconds of interaction. Single key presses resulted in numerical code values being assigned to that time interval and written to disc. The coded data was subsequently transferred to a mini-computer for statistical analysis. The mothers' utterances were translated by a research worker fluent in the relevant local languages (Zulu, Tswana and Pedi).

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The filmed interaction of each dyad was viewed and coded four times: three times while viewing 2-second segments of the ongoing interaction and separately coding the mother's or the infant's behaviour, or their state of coorientation; and once, using the functional level of codes, while viewing 10-second segments of videotape. The assigned codes for the dyad, for each time interval, were then combined. Interobserver agreement for the coding categories varied between 85,6% and 100% as calculated from the codes resulting from the analysis of two dyads, each over three minutes of interaction. The lower percentage agreements were obtained for two categories of infant behaviour: hand and arm gestures, which appear to be inherently ambiguous, and states of coorientation where inaccuracies arose as a result of the rapid switches of attention amongst older infants.

Results and Discussion

Gaze, smiling and vocalisation in communicative exchanges

When the mothers were asked to interact with their babies they looked at their infants almost constantly, glancing away only when intrusive noises or events distracted them. Mothers of both the younger and older infants gazed at their infants for over 96% of the time. This unwavering maternal gaze, similarly observed in all Anglo-American studies, formed a 'frame' for the infants' attentional states (Kaye & Fogel 1980), establishing thereby the possibility of a communicative channel which could be utilised each time their infants' gaze turned to them. In this sense, the potential for periods of mutual gaze always rested with the infant.

However, older and younger infants differed in the extent to which mutual gaze did form the foundation of interactional periods. Older infants gazed at their mothers less than younger infants, and gazed away from the interpersonal context more often, as can be seen in Table I.

TABLE I - DISTRIBUTION OF INFANTS' GAZE DURING 'CHAT'

(Mean percentage frequency)

	Direct gaze at other	Follow movement of other	Gaze at own hands	Gaze away
Older infants	45,2	16,6	14,5	21,9
Younger infants	68,3	10,2	15,2	4,3

$X2 = 18,07$, $df=3$, $p<0,01$

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Declining attention to the mother and her activities with age has been well established as a developmental change beginning around the middle of the first year (Collis 1977, Trevarthen 1977, Fafouti-Milenkovic 1979, Collis 1981, Fogel 1982). However, these African infants showed much higher levels of interpersonal gaze than have been reported for Western infants. For example, Kaye & Fogel reported a decline in attention to mother from 55% at 6 weeks to 29% at 26 weeks, and Trevarthen & Marwick (1982) recorded 21.32% of mutual gaze at 18 weeks. The high levels of infant attention to mother and the relatively slow decline over time observed in this study were similar to those reported for Yoruba infants by Trevarthen & Marwick (1982).

The decline in the frequency of mutual regard during the first year is nonetheless a common phenomenon amongst infants studied. For the younger infants, gaze constituted an highly salient element of interactional episodes. As Jaffe et al (1973) put it, 'looking' is the young infant's primary contribution to social contact. For the older infants, however, gaze no longer played a definitional role in the interaction between mother and baby because other methods of communication based on mutual understanding had begun to play a role.

The simple measure of the amount of time infants spent gazing at their mothers masked an important difference in the temporal patterning of the gaze states of younger and older infants. The older infants did not spend protracted periods gazing away from their mothers. Both they and the younger infants glanced away for varying time periods with a mean 'away' duration of 4 seconds. But the older infants' mean duration of gaze at the mother was half (8 seconds) that of the younger infants (16 seconds). Decreased gaze duration and decreased periods of interaction with age have also been reported by others (Friedman et al 1976, Trevarthen & Marwick 1982, Messer & Vietze 1984). The younger infants spent long periods gazing at their mothers with infrequent breaks of attention whereas the older infants switched attention towards and away from the mother more frequently. This difference in gaze duration largely accounted for the lower frequency of 'looking at mother' amongst the older infants, rather than the fact that they gazed away from the mother for longer periods. Similar data led Kaye (1982) to interpret the declining frequency in interpersonal gaze as indicating a shift away from a 'captive' fixation on the mother's face to an active exploration of the environment, rather than as declining interest in the mother.

The mothers' interpersonal behaviour showed an accomodation towards these differences in gaze patterns. Although, as mentioned previously, all mothers visually monitored their infants, the mothers of the older infants smiled and vocalised significantly less than the mothers of the younger infants (see Table II). A similar decrease in maternal vocalisations between one and eight months of age has also been reported by Sullivan & Horowitz (1983).

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TABLE II - MATERNAL SMILES AND VOCALISATION DURING 'CHAT'

(Mean percentage frequency)

	Mother Smile	Mother Vocalise
Older Infants	77,4	81,5
Younger Infants	90,5	91,6
X2, df=1	6.37 *	4,38 *

* p<0,05

During those periods when infants gazed away, the mothers tended to remain quiet and waiting. Because the older infants gazed away more frequently, such passive episodes on the part of the mothers of the older infants increased, resulting in lower mean frequencies of smiling and vocalisation. Kaye & Fogel (1980) also observed that mothers did not resist the 'away' gazes of older infants, but that their activities began to correspond more and more to their infants' attentive phases. In addition, it should be noted that the mothers in this study vocalised at levels similar to those reported for Western mothers and did not show the lower rates of vocalisation reported for other African mothers; for example, Trevarthen & Marwick (1982) reported maternal vocalisation rates of between 50-75% for their Yoruba mothers.

Older and younger infants, however, showed no differences in their rates of vocalisation and smiling. Both groups smiled about 35% of the time and vocalised about 25% of the time. Although the average frequency of vocalisations of the two groups of infants did not differ, there was a significant difference in the number of vocalisations which accompanied direct gaze at the mother. Ninety three per cent of the younger infants' vocalisations occured while they were looking directly at the mother whereas only 70% of the older infants' vocalisations occured while they were looking at the mother ($X2 = 17,44$, $df=1$, $P<0,01$).

The older infants' lower frequency of gaze at mother, together with their lower frequency of vocalisations accompanied by gaze at mother do not necessarily indicate that their interest in the mother has declined. Older infants could continue to engage in communicative episodes while gazing away from their mothers. Sometimes the older infants initiated, and responded with gaze and vocalisation towards events, noises and people which excluded their mothers. However, at other times both their gaze away from their mothers, and their vocalisations which were unaccompanied

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by direct gaze at the mother, were still other-directed as interpreted in the light of the context in which they occured. But in these cases, as will be discussed later, either the mothers, or the infants had broadened the interpersonal milieu to include distant or absent objects or people; as for example, when the mother began an interactional sequence requesting the infant to call or look for the family dog. This enlargement of the interpersonal concerns of mother and infant did not occur with the younger dyads whose interaction was almost entirely limited to actions and events between the partners.

Despite the fact that states of coorientation (Collis 1979) or periods of common interest become, to some extent, independent of mutual gaze, older infants and their mothers still spent significantly less time in such states (60,3%) than the younger dyads did (77,7%; $X2 = 4,69$, $df=1$, $p<0,05$). The older infants' interests have thus clearly begun to extend beyond the mother and beyond what is shared with the mother alone.

Games and the content of interactions

The behaviour of mothers during interaction with their infants has been described as taking on a characteristic form, with repetition, slowing and exaggeration being prominent features (Brazelton et al 1974). So much so that Stern (1974) has referred to these typical behaviours as 'infant-elicited maternal facial, vocal and gaze behaviours'. Stern et al (1977) have described the way in which uniformity and variability in the behaviour of mothers are expressed and contained in phrases, runs and episodes of maternal actions. This conveys the impression of the creation of themes with variations.

In this study, mothers were observed to behave in this way with their rhythmic body movements, smiles and repetitive speech, providing a constant stream of actions that Tronick et al (1979) have referred to as 'continuates'. However, the mothers of older and younger infants showed differences with regard to the variability they introduced into their behaviour. Themes were defined as a set of maternal actions which occurred repetitively as a 'package' (Beebe & Gerstman 1981); for example, coming in close, talking softly and smiling. A variation was regarded as any elaboration or alteration that was introduced into such a theme - for example, taking the infant's hand, increasingly exaggerating head-bobbing, varying the site of tickling and so on. The mothers of the older infants introduced twice the number of themes (an average of 10) and many more variations (an average of 15) as opposed to the mothers of younger infants (an average of 5 themes and 7 variations). In addition, in 39% of observed time intervals, the behaviour of the mothers of younger infants was a repetition of a set of actions they had ennacted at least once previously, in contrast to a repetition rate of 25% amongst the mothers of the older infants ($X2 = 4,50$, $df=1$, $p<0,05$). Stern et al (1977) interpreted such maternal behaviour towards young infants as serving to contain or hold down variability within parameters which were manageable for their infants. The mothers of older and younger infants in this study were clearly

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sensitive to perceived differences in the levels of stimulation which were tolerable for their infants.

Trevarthen & Hubley (1978) noted that games and play rituals were characteristic of interactions after three months of age, and the interactions observed between mothers and infants in the present study were very playful. However, this playfulness did not comply with the conventionalised sense of games referred to by Field (1979b) as 'universal' infant games and which include 'peek-a-boo', 'pat-a-cake' and so on. The mothers did not appear to play any communally ritualised baby games of this kind. Although songs, chants, tickles, mock startles, making faces and so on were incorporated into the playful interchanges of all the dyads, their content and the manner in which they were used was individualistic to each mother-infant pair. It is therefore difficult to compare the levels of playfulness of these dyads with reports such as that by Field (1982) where the definition of games rests on communal recognition and expression. Nonetheless, playful exchanges occured about 45% of the time amongst both the older and younger dyads, a figure not very different from the 3[illegible]% occurence of games as reported by Field (1982).

However, the kinds of games played by the older and younger groups differed considerably. As reported by others, amongst the younger infants, the majority of playful interchanges were ones which involved the mothers' stimulation of the infants by tickling, touching and other body games (Snow et al 1979, Kaye & Fogel 1980, Kaye 1982). Such games occured 28% of the time amongst the younger infants, and only 10% of the time amongst the older infants. However, mothers of the older infants played twice the number of 'funny' voice, face and mouth games as compared to the mothers of younger infants. A comparison of these differences in game-playing between the two groups was significant ($X2 = 11,14$, $df=3$, $p<0,05$), and was consistent with the nature of mother-infant games observed by others (Snow et al 1979, Kaye & Fogel 1980, Kaye 1982).

The two groups of infants paid differential attention to their mothers' game-playing as compared to their general level of attention to their mothers, as shown in Table III. The older infants attended to their mothers more when they played 'funny' voice, face and mouth games, and significantly less when their mothers tickled and touched them. In contrast, the younger infants attended to their mothers significantly more when their mothers played tickle games. It therefore appears as if the games played by mothers is, to some extent, determined by their infants' response to those games; and as infants show a declining interest in touch-and-tickle games and an increasing interest in games which involve sounds, facial expressions and mouth movements, mothers make a corresponding adjustment to these preferences and play more of those games that they know will elicit and hold their infants' attention.

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TABLE III - INFANTS' ATTENTION TO MATERNAL GAMES

(Mean percentage frequency)

Games	Older Infants	Younger Infants
General level of attention	60,3	77,7
'Funny' Face, Voice and Mouth	81,25	71,25
	X2 = 10,6, df=1, p<0,01	
Tickling and Touch	37,66	39,81
	X2 = 10,26, df=1, p<0,01	X2 = 5,38, df=1, p<0,01

The content of mothers' vocalisations to their infants also changed according to their infants' age (See Table IV). Here significant differences were found in the extent to which mothers chatted, made different sounds and chanted or sang to their infants. 'Chat' was defined as any statement or comment by the mother which was not a question, or a positive or negative directive, such as 'I know you want to stand up', or 'We are going to see daddy soon'. Similar to the results reported by Freedle & Lewis (1977) mothers vocalised in more affect-expressive ways towards their younger infants and used more meaningful speech with their older infants.

TABLE IV - MOTHER'S VOCALISATIONS TO OLDER AND YOUNGER INFANTS

(Mean Percentage Frequency)

	Chat	Sounds	Chant-Sing
Older Infants	44,45	45,42	10,35
Younger Infants	20,1	30,24	34,62
	X_4 = 13,56	X2 = 4,89	X2 = 16,89
df=1	p<0,01	p<0,05	p<0,01

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Amongst the younger dyads typical interactions were those whereby mothers touched and tickled their infants and accompanied these games with chanting and singing. The purpose pursued by the mothers seemed to be to maintain their infants' attention and to produce positive infant affective expressions. Infants tended to respond to these maternal actions with intense interest and amusement. However, amongst the older dyads, both participants appeared to be more interested in interactions which included specific types of behaviour, like speech and speech-like sounds and permutations of the face, voice and mouth. As infants grow older the range of their interests expands beyond being simply a spectator to, and recipient of, their mothers' actions. Mothers appear both to respond to these enlarged interests and to be directed by a developmental agenda whereby the interactions they introduce towards the end of the first year increasingly focus on speech, speech-like sounds and variations upon conventionalised facial and vocal expressions.

The interactions between younger infants and their mothers existed solely in the immediate context of expressions of affect towards one another. In contrast, older infants and their mothers followed the other's concern with matters other than interpersonal exchanges of affect. All the mothers of the older infants played some form of a 'where's the ... ?' game, an observation consistent with a report by Schaffer (1984). Such games illustrate the existence of a shared memory of past experiences between mother and infant and the existence of the use of increasingly conventionalised understandings between them. Mothers also followed and elaborated upon their infants' reactions or initiatives towards people or events other than themselves by, for example, labelling a noise of which the infant seemed to become aware. In this sense, their interaction frequently involved a topic towards which each was able to direct the other and offer comment within a limited range of conventionalised signs.

Conclusions

The results presented offer confirmation from another culture of the development of previously described forms of communication during the first year of life. The intense mutual regard and the 'interest and delight in one another' (Stern 1974) characteristic of the younger group of infants substantiates the period of primary intersubjectivity as described by Trevarthen (1979). Similarly, the broadened perspective of the communication between the older infants and their mothers, encompassing topics other than themselves even in the absence of available near objects, conforms to that stage in communicative development described as secondary intersubjectivity.

The mothers' behaviour also corresponded to that described as typical amongst Western mothers. They showed the same purpose in trying to establish dialogues with their infants and the same propensity to treat their infants as if they were communicating persons. In addition, the methods they used to achieve these

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ends were very similar. The sensitivity of the mothers to their infants' increasing competence with development was clearly evident in the way their behaviour became more complex and variable, the manner in which their vocalisations changed and the alterations they effected in the games which they played with their infants. This adaptation of maternal behaviour was consistent with Adamson & Bakeman's speculation that "mothers' actions change over time in a way that is consistent with their infants' growing interest in conversing about objects and events using increasingly conventionalised actions" (1984, p. 469).

The only differences between the dyads studied and the reports in the literature were the persistence of face-to-face interaction for a longer period than is expected amongst Western dyads and the absence of communally ritualised infant games such as 'pat-a-cake'. However, consistent with Trevarthen & Marwick's (1982) observations of Yoruba mothers and infants, these mothers all engaged in a form of communally-shared infant play which consisted of rhythmic touching or gentle 'cuffing' of their infants' cheeks and bodies. This behaviour on the part of mothers was very successful at achieving and maintaining joint regard and smiling and seemed to be related to the persistence of high levels of interpersonal interaction.

It would be exceedingly difficult to speak of an 'African' culture in the face of the existence of the many different language groups and patterns of living which are present in Africa. Nonetheless, many similarities exist amongst Africans in child-rearing practices, including demand feeding and sleeping, close physical contact with the mother and multiple caretaking which has the effect of exposing the infant to many varied social experiences (Mundy-Castle 1980). The results presented here for one group of African mothers and infants are highly consistent with the descriptions offered by Trevarthen & Marwick (1982) of Yoruba dyads in Lagos. Despite the great cultural and economic differences between these two groups of African mothers and infants and their Western counterparts, striking similarities exist in the changes which take place in the mother-infant relationship during the first year of life. These findings add weight to the assertions that these early developmental changes in both mothers and infants comprise a set of universal adaptations for the introduction of infants to social and cultural consciousness.

It has been noted that 'en face' interactions become difficult to maintain between Western mothers and infants after six months of age due to their infants' increasing interests in objects (Adamson & Bakeman 1982). In this condition of the study mothers and infants were not given the opportunity to handle and exploit immediately available objects. Nonetheless, 'topics' beyond the dyad emerged by way of references to absent or distant objects, people and events. In developmental accounts therefore, references to infants' increasing interests in objects should not lead to a too literal interpretation of the notion of objects. The terms 'topics' or 'third parties' as used by Trevarthen

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(1977) and Schaffer (1984) respectively, would seem to be appropriate descriptions of the infant's enlarged interests in the world. If a distinction is to be drawn between literal objects and the more generic and abstract concept of 'topics', the presumed basis of this developmental progression being the increasing manipulative competence of infants (Trevarthen 1977, Fafouti-Milenkovic & Uzgiris 1979, Schaffer 1984), may require to be re-evaluated.

Our observations, in accordance with those of Mundy-Castle (1980) and Agiobu-Kemmer (1984) in Nigeria, are that African mothers seldom introduce toys or objects to their infants and seldom engage in object-play with their infants. Dixon et al. (1984) have observed significant differences between Gusii and American mothers with regard to their interaction around a teaching task involving an object. Whilst the American mothers' behaviour conformed more to the notion of "teaching how to learn", the behaviour of the Gusii mothers was described as "teaching a skill". Clearly, the manner in which cultural knowledge and expectations regarding object use and exploration might affect infants' development and the kinds of adult-infant interactions around objects, remains an important research question.

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Appendix 1

Figures 1-3	Relatively affluent familes with television sets and telephones. Note the tribal dress of the grandmother and the modern appearance of the mother in Figure 1.
Figures 4-6	Poorer families with simple homes and few facilities.
Figures 7-9	The range of homes, from one of the most affluent (Figure 7) to one of the poorest (Figure 9).
Figure 10	Mothers with their babies in the community health centre, waiting to be filmed.
Figure 11	The technical arrangements for videotaping the interactions between mothers and their babies.

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